

THE CLAIMS

What is claimed is:

1. A golf ball comprising:
a core;
a cover comprising a non-ionic polymer material; and
an intermediate layer disposed between the core and the cover, wherein the intermediate layer comprises a polymer composition comprising at least one ionomer and at least one polyamide polymer.
2. The golf ball of claim 1, wherein the non-ionic polymer material comprises a thermoset polymer.
3. The golf ball of claim 2, wherein the thermoset polymer comprises a functionalized thermoset polymer, a thermoset copolymer, a functionalized thermoset copolymer, or mixtures thereof.
4. The golf ball of claim 3, wherein the thermoset polymer comprises polyurethane.
5. The golf ball of claim 3, wherein the thermoset polymer comprises polyurea.
6. The golf ball of claim 3, wherein the thermoset polymer comprises trans-polyisoprene.
7. The golf ball of claim 1, wherein the ionomer comprises homopolymers or copolymers of olefin, polyester, copoly(ether-ester), copoly(ester-ester), polyamide, polyimide, polyether, polyurethane, polyacrylate, polystyrene, hydrogenated styrene butadiene styrene, polycarbonate, or mixtures thereof.
8. The golf ball of claim 1, wherein the ionomer comprises a copolymer of an olefin and an α,β -ethylenically unsaturated mono- or di-carboxylic acid, wherein the carboxylic acid groups are fully neutralized with at least one metal ion.

9. The golf ball claim 8, wherein the metal ion comprises zinc, sodium, magnesium, manganese, calcium, lithium, or potassium.
10. The golf ball of claim 1, wherein the polyamide polymer is selected from the group consisting of nylon 4, nylon 6, nylon 7, nylon 11, nylon 12, nylon 13, nylon 4,6, nylon 6,6, nylon 6,9, nylon 6,10, nylon 6,12, nylon 12,12, nylon 13,13, and mixtures thereof.
11. A golf ball comprising
a core;
a cover comprising a non-ionomeric thermoplastic polymer material; and
an intermediate layer disposed between the core and the cover, wherein the intermediate layer comprises a polymer composition comprising at least one ionomer and at least one polyamide polymer.
12. The golf ball of claim 11, wherein the non-ionomeric thermoplastic polymer material comprises a functionalized polymer, a copolymer or functionalized copolymer, or mixtures thereof.
13. The golf ball of claim 12, wherein the non-ionomeric thermoplastic polymer material is selected from the group consisting of a polyamide, a polycarbonate, a poly(phenylene oxide), imidized amino group containing polymers, high impact polystyrene, polysulfone, poly(phenylene sulfide), reinforced engineering plastics, polytetrafluoroethylene, nonionic olefinic homopolymers, and nonionic olefinic copolymers.
14. The golf ball of claim 11, wherein the ionomer comprises a copolymer of an olefin and an α,β -ethylenically unsaturated mono- or di-carboxylic acid, wherein the carboxylic acid groups are fully neutralized with at least one metal ion.
15. The golf ball claim 14, wherein the metal ion comprises zinc, sodium, magnesium, manganese, calcium, lithium, or potassium.

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16. A golf ball comprising a core and a cover wherein at least one layer comprises:
a core;
a cover comprising a first polymer composition comprising:
at least one polyamide polymer; and
at least one copolymer of an olefin and an α,β -ethylenically unsaturated mono- or di-carboxylic acid, wherein the carboxylic acid groups are fully neutralized with at least one metal ion;
an intermediate layer disposed between the core and the cover, wherein the intermediate layer comprises a second polymer composition comprising at least one ionomer and at least one polyamide polymer.
17. The golf ball of claim 16, wherein the metal ion comprises zinc, sodium, magnesium, manganese, calcium, lithium, or potassium.
18. The golf ball of claim 16, wherein the at least one ionomer comprises at least one copolymer of an olefin and an α,β -ethylenically unsaturated mono- or di-carboxylic acid, wherein the carboxylic acid groups are fully neutralized with at least one metal ion.
19. The golf ball of claim 18, wherein the metal ion comprises zinc, sodium, magnesium, manganese, calcium, lithium, or potassium.
20. The golf ball of claim 16, wherein the second polymer composition further comprises at least one copolymer of an olefin and an α,β -ethylenically unsaturated mono- or di-carboxylic acid, wherein the carboxylic acid groups are fully neutralized with at least one metal ion comprising zinc, sodium, magnesium, manganese, calcium, lithium, or potassium.
21. The golf ball of claim 16, wherein the polyamide polymers of the first and second polymer compositions are selected from the group consisting of nylon 4, nylon 6, nylon 7, nylon 11, nylon 12, nylon 13, nylon 4,6, nylon 6,6, nylon 6,9, nylon 6,10, nylon 6,12, nylon 12,12, nylon 13,13, and mixtures thereof.